

We Claim:

1. An energy storage system for providing power to a load, comprising:
a power module including at least one ultracapacitor adapted to store and discharge energy, said power module providing an output voltage as said ultracapacitor discharges energy; and
a regulator adapted to regulate the output voltage of the power module, said regulator including a discharge control circuit adapted to provide a predetermined voltage profile across said load, said profile being a function of a present voltage of said power module.
2. The energy storage system according to claim 1, wherein the discharge control circuit includes a comparator for comparing a voltage across said load to a reference voltage, and a power stage for controlling said regulator based on an output of said comparator.
3. The energy storage system according to claim 1, wherein the regulator is adapted to boost the output voltage when the output voltage falls below a predetermined threshold.
4. The energy storage system according to claim 1, wherein the regulator is adapted to boost the output voltage to a voltage within a predetermined range.
5. The energy storage system according to claim 1, wherein the regulator includes at least one inductor circuit.
6. The energy storage system according to claim 5, wherein said regulator includes two or more interleaving inductor circuits.
7. The energy storage system according to claim 6, wherein each of said interleaving inductor circuits includes a switch and an inductor, and wherein said switches are

adapted to be selectively closed and opened, thereby selectively storing energy in said inductors and discharging energy to said load.

8. The energy storage system according to claim 7, wherein said switches are controlled by said discharge control circuit.
9. The energy storage system according to claim 6, wherein each of said interleaving inductor circuits is adapted to selectively pass current to said load and bypass said load.
10. A regulator circuit for regulating an output from an ultracapacitor power source powering a load, comprising:
 - an inductor circuit having at least one inductor;
 - switching means for selectively opening and closing said inductor circuit for selectively discharging energy to said load and storing energy in said inductors; and
 - a discharge regulating circuit adapted to control an output voltage profile, said discharge regulating circuit monitoring a present voltage from said power source and controlling said switching means in response to said present voltage.
11. A regulator circuit for regulating an output from an ultracapacitor power source powering a load, comprising:
 - two or more interleaved inductor circuits, each inductor circuit having at least one inductor;
 - switching means for selectively opening and closing each of said inductor circuits for selectively discharging energy to said load and storing energy in said inductors; and
 - a discharge regulating circuit adapted to control an output voltage profile, said discharge regulating circuit monitoring a present voltage from said power source and controlling said switching means in response to said present voltage.